

PHOTOGRAPHIC INTERPRETATION REPORT

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SAN CRISTOBAL MRBM LAUNCH SITE 3
CUBA



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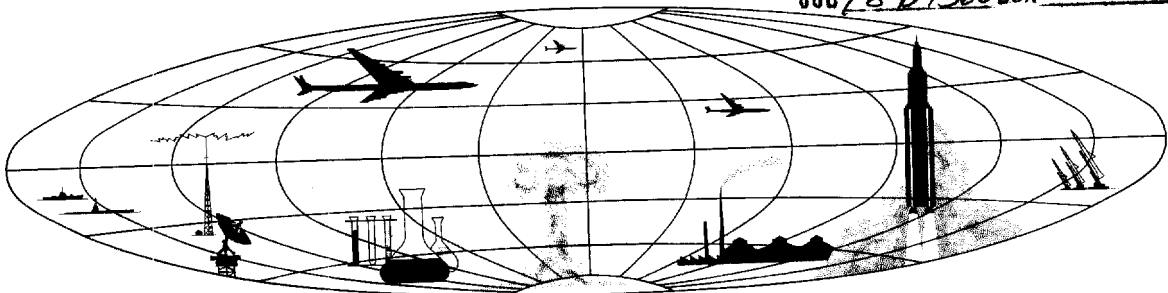


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PHOTOGRAPHIC INTERPRETATION REPORT

SAN CRISTOBAL MRBM LAUNCH SITE 3
CUBA

NPIC/R-1393/63

July 1963

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PREFACE

This report was prepared under NPIC Project JN-310/62 in response to ONI requirement 132-62. The photographic material used in the report was extracted from high- and low-level missions flown [redacted] [redacted] The quality of the photography ranges from good to excellent. This study has emphasized the chronology of site development rather than the description and mensuration of equipment because the latter data have been adequately presented in published documents. 1/

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SUMMARY

San Cristobal MRBM Launch Site 3 was first observed on photography [REDACTED]. There was no evidence of the site on photography [REDACTED] the last previous coverage of the area.

When first observed, the launch facilities were in an early stage of development, although the support facilities were more extensive than those observed at other Cuban missile sites. The construction of eight permanent, single-story, frame, barracks-type buildings [REDACTED] each, was unique and suggests that the intended function of this site was different from that of the other sites. If, for example, this were to have been a headquarters site, the construction

of permanent support facilities might have been of greater urgency than the construction of launch facilities.

In its most advanced stage, the site contained 4 launch positions with erectors and associated control equipment [REDACTED]

[REDACTED] 4 missile-ready tents, a microwave communication facility, a temporary tent support area, 8 buildings under construction, foundations/excavations for 7 additional buildings, a loop road network, an AA battery, and defensive trenching. The development of the launch facilities from an early stage of construction to a probable operational capability was accomplished [REDACTED]

INTRODUCTION

ONI requirement 132-62 requested an analysis of the development of San Cristobal MRBM Launch Site 3. A description of day-by-day construction progress at that site therefore forms the main body of this report. A description of a typical MRBM launch site construction pattern based on data from all four San Cristobal sites and the Sagua la Grande sites precedes the study of San Cristobal MRBM Launch Site 3. This composite description was included because not all elements of a typical deployed MRBM site in Cuba were observed at San Cristobal MRBM Launch Site 3. A glossary of missile-related equipment and pertinent photographs follow the introduction.

The group of Soviet MRBM sites referred to as the San Cristobal sites were situated on the south side of the east-west Sierra del Rosario mountain range. The four sites extended approximately 25 nautical miles (nm) from the vicinity of San Diego de los Banos in the west to the

vicinity of Candelaria in the east. They were designated from west to east as: San Cristobal MRBM Launch Site 1, near San Diego de los Banos; San Cristobal MRBM Launch Site 2, near Los Palacios; San Cristobal MRBM Launch Site 3, near San Cristobal; and San Cristobal MRBM Launch Site 4, near Candelaria (Figure 1).

The following general statements pertain to developmental progress at the four sites during the period [REDACTED]

1. San Cristobal MRBM Launch Site 1 was at all times the furthest advanced of the four sites and was probably operational shortly after it was identified.

2. San Cristobal MRBM Launch Site 2 was in a very early stage of development when first observed and progressed to an advanced level of readiness.

3. San Cristobal MRBM Launch Site 3 was in an early stage of development when first observed and showed the least progressive opera-

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tional development of all the sites, notably in the lack of missile transporters, missile-fuel trailers, and oxidizer tank trailers.

4. San Cristobal MRBM Launch Site 4 was observed at the very beginning of its development and progressed to a fairly advanced stage.

GLOSSARY OF MISSILE-RELATED EQUIPMENT

Missile transporter -- A six-wheeled canvas-covered trailer used to transport missiles by road (Figure 2). The trailer has two wheels in front and dual wheels at the rear. The canvas is supported by inverted U-shaped metal ribs. The trailer may be drawn by truck or prime mover.

Prime mover -- A wheeled or tracked tractor

similar to a tractor for a semitrailer (Figure 3). It is used to pull heavy trailers.

Missile erector -- A semitrailer of heavy structural steel which is used to erect a missile on its launch stand (Figure 4). It also serves as the transporter of the missile launch stand. It may be equipped with a heavy duty winch.

Launch stand -- A heavy steel table on which a

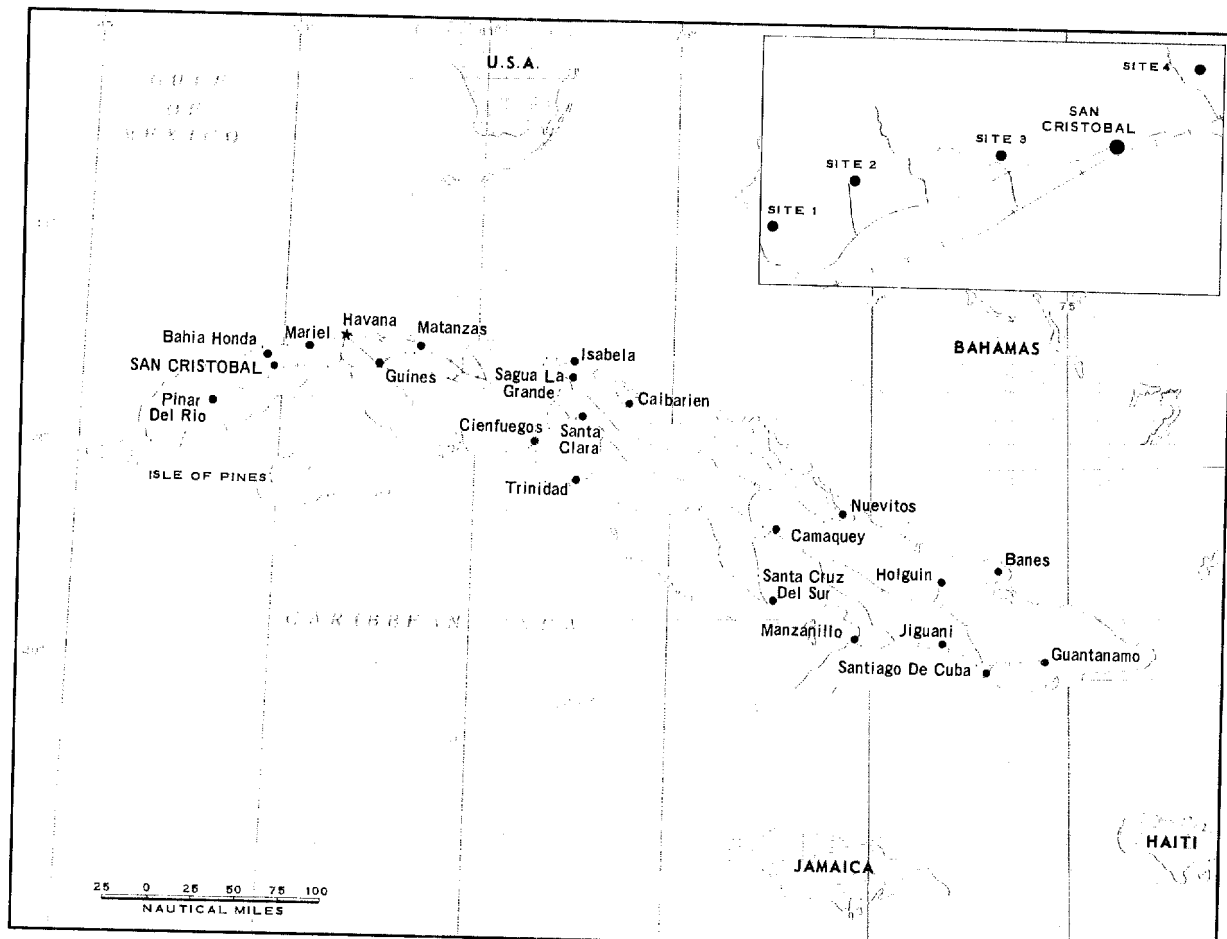


FIGURE 1. LOCATION OF SAN CRISTOBAL MRBM LAUNCH SITES.

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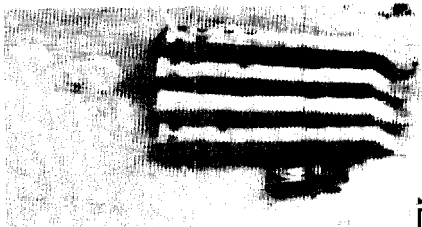


FIGURE 2. MISSILE TRANSPORTERS.

missile is erected for firing (Figure 6). The launch stand probably has a large hole in its center and a cone-shaped flame deflector beneath it. Missile-fuel tank trailer -- A 12-wheeled semi-trailer with an oval-shaped tank similar to those used to deliver gasoline to service stations (Figure 5). It has six dual wheels, two in front and four at the rear.

Missile oxidizer tank trailer -- A 12-wheeled trailer with a cylindrical tank having six dual wheels, two in front and four at the rear (Figure 3).

Missile-ready tent -- A long narrow tent in which a missile on its transporter is placed for shelter and for prelaunch checkout (Figure 7).

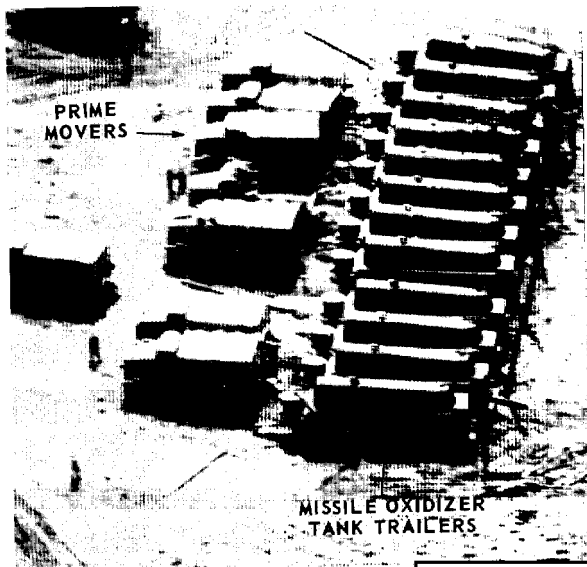


FIGURE 3. PRIME MOVERS AND MISSILE OXIDIZER TANK TRAILERS.



FIGURE 4. MISSILE ERECTORS.

Launch position -- The missile launch stand from which the missile is fired and its associated equipment (Figures 6 and 7).

Theodolite station -- A small shedlike structure without walls which houses a theodolite used in missile orientation (Figure 7).



FIGURE 5. MISSILE-FUEL TANK TRAILERS.

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TYPICAL LAUNCH SITE CONSTRUCTION PATTERN

This section presents a composite description, based on data from all four San Cristobal sites, of the sequence of development of a deployed MRBM site in Cuba. The development of a typical site is arranged in four overlapping phases.

PHASE 1 -- SITE SELECTION (HYPOTHETICAL)

Although the site selection phase cannot be verified from photography, it is considered likely that a preconstruction effort to acquire and survey land suitable for a launch area was undertaken for an undetermined length of time. Considerations probably included the availability of land, terrain characteristics, natural concealment, and the presence of access roads. A precise survey of geodetic positions of the intended launch positions was probably accomplished during this phase.

PHASE 2 -- SITE OCCUPATION

Support Facilities. Trucks, vans, trailers, miscellaneous equipment such as generators, and personnel concerned with the establishment of support facilities are the first elements to arrive at the launch site. Personnel tents for messing and berthing, field kitchens, latrines, and other housekeeping facilities are set up. Support vehicles, taking advantage of natural concealment, are parked at random throughout the area. Road construction and/or improvement is started. Tracked prime movers and trucks equipped with scraping blades have been observed, indicating that support vehicles may be utilized in leveling and scraping during this initial construction stage.

Missile Equipment. Mobile missile-related equipment including missile transporters,

missile erectors, missile-fuel and oxidizer tank trailers, missile control vans, electronics vans, and generators are brought to the site in convoy and parked throughout the area. The units are

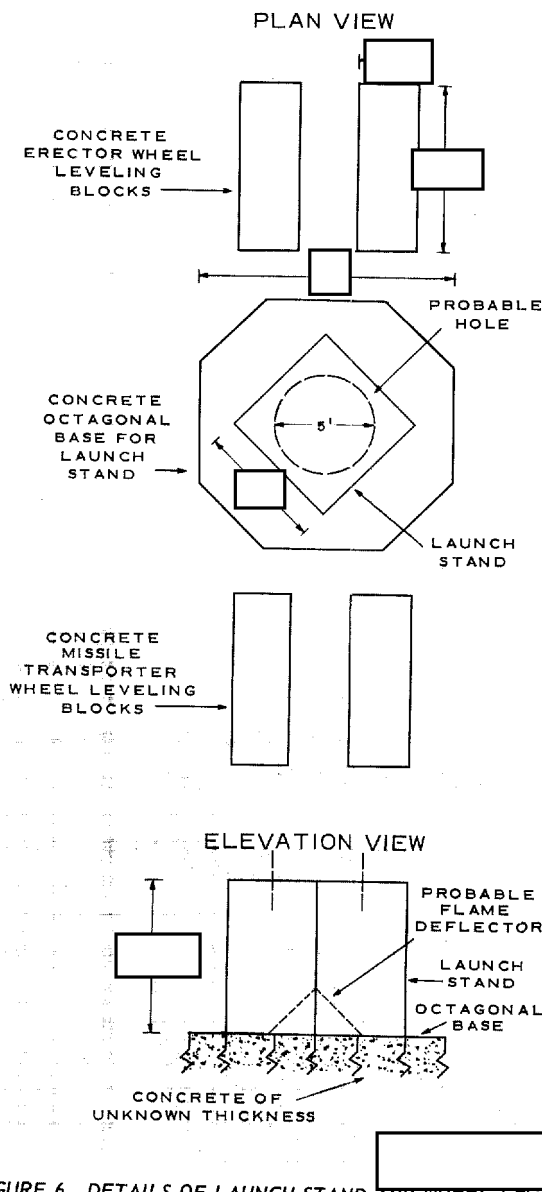


FIGURE 6. DETAILS OF LAUNCH STAND AND WHEEL LEVELING BLOCKS.

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usually parked together by type and take advantage of natural concealment. The missile-fuel and oxidizer trailers are pulled by truck or prime mover on good roads and have been seen being pulled by tracked prime mover within the sites in areas with no roads.

PHASE 3 -- LAUNCH POSITION CONSTRUCTION

After the support facilities have been established and missile-related equipment is present at the site, the launch positions are prepared. Probably precast concrete forms--used as bases for launch stands and wheel leveling blocks for missile transporters and erectors--are em-

placed in previously leveled launch positions. Bases for launch stands are octagonal and wheel leveling blocks for transporters and erectors are oblong. Two pairs of wheel leveling blocks--arranged on opposite sides of the base--are used at each launch position (Figure 6). The missile erector is then brought into position adjacent to the octagonal base and the launch stand, which is transported on the erector, is put in place on the base.

Cabling is then installed from the launch stand to an unidentified piece of equipment, possibly a junction box, and thence to a control van usually situated in a concealed position. Next, missile-ready tents are erected in close

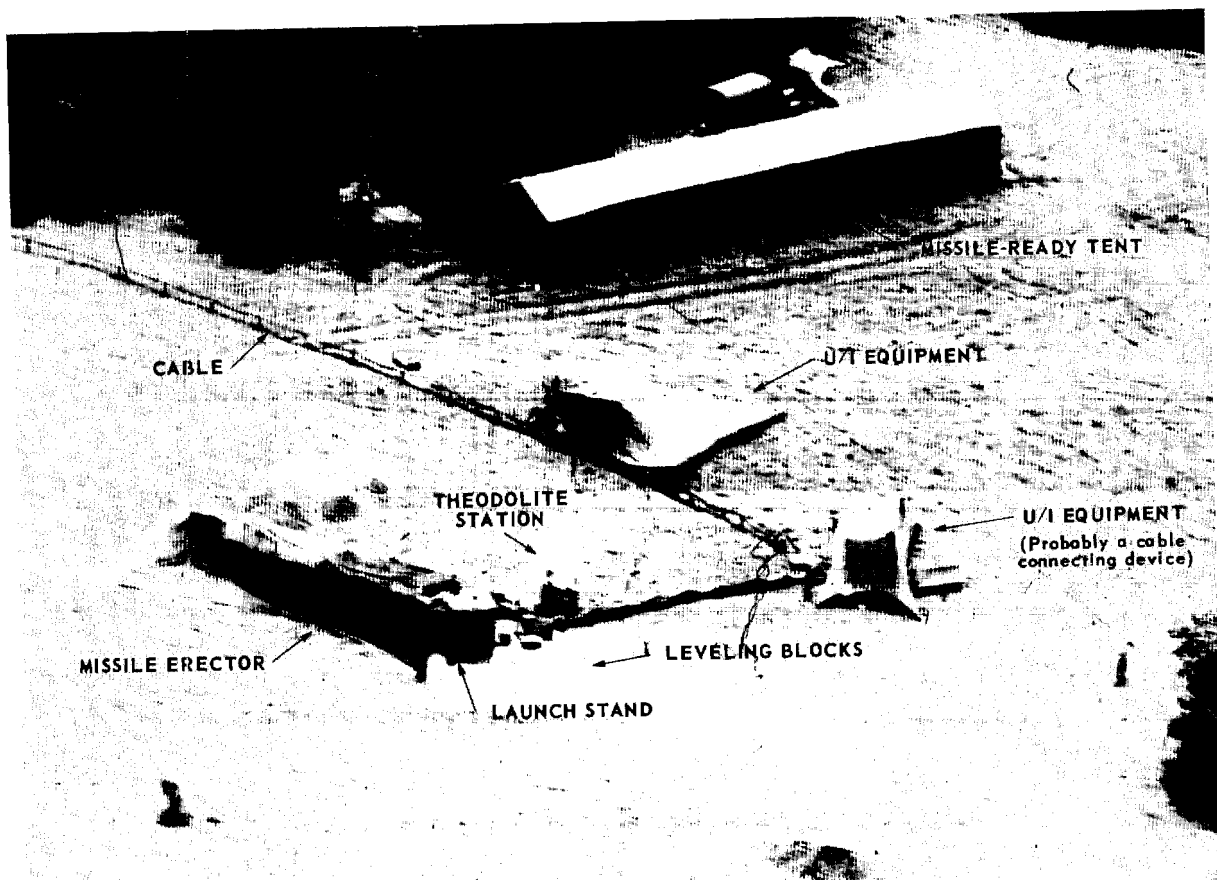


FIGURE 7. TYPICAL COMPLETED LAUNCH POSITION

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proximity to each launch position and missile transporters are moved into the tents. Cabling is then installed between the tents and nearby generators. Missile checkout probably takes place at this point. In one instance, two vans were parked adjacent to a missile-ready tent and were connected to it by two large socklike tubes, indicating that some form of environmental control was being exercised within the tent. At this point the launch position is probably operational (Figure 7).

PHASE 4 -- LAUNCH SITE IMPROVEMENT

After the launch position is operational, attention is devoted to improving existing facilities and to making the site more habitable. Hardstands or earth stabilizations for erectors,

transporters, and missile-ready tents are constructed adjacent to the launch positions in appropriate places. Surfaced walkways in support areas, outdoor movie theatres, and volleyball courts are installed during this phase, indicating that some leisure time is available for site personnel. Camouflage in the form of nets, canvas, and tree branches is put in place, both vertically and horizontally. Cabling is raised above ground on T-shaped stakes and protective fencing is placed around generators. Microwave communications towers are set up in conjunction with communications vans. A POL facility is established and construction is begun on permanent buildings. Finally, defensive positions consisting of personnel trenches and AA positions are emplaced.

SAN CRISTOBAL MRBM LAUNCH SITE 3

San Cristobal MRBM Launch Site 3 (Figure 8) was located 5 nm west of San Cristobal at 22-42-40N 83-08-25W. An improved dirt

road extending from Highway 1-25 provided access to the site. This highway joins the Carretera Central 2 nm east-southeast of the

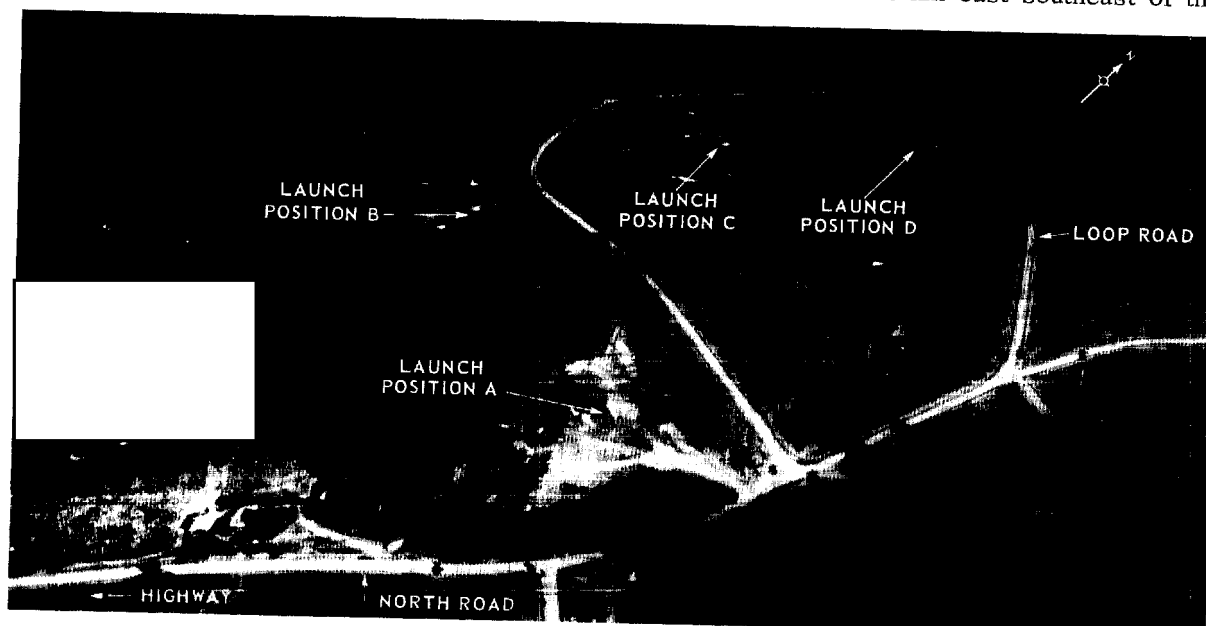


FIGURE 8. SAN CRISTOBAL MRBM LAUNCH SITE 3

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site at Santa Cruz de los Pinos. A description of day-by-day construction progress at the site follows (Figure 9).

[REDACTED] Two roads extend east-northeast from the access road. The northern one, .75 nm long, has a driveway [REDACTED]

[REDACTED] Concrete arch sections lie on the ground near the excavation. About 1,300 feet northeast of the driveway is a loop road extending to the northwest. Nine buildings which predate the site are located near the northern road. About 700 feet southeast of the northeast

end of this road are seven building foundation excavations, each 40 by 20 feet.

The southern road leads to the support area. In this area are 36 tents: 15 measure [REDACTED] feet; 12 measure 20 by 15 feet; and 9 measure 10 feet square. On the north side of the road are eight single-story frame buildings under construction which measure [REDACTED] each. The buildings are arranged in a row. Seven of them have walls but no roofs and the eighth has only a foundation. Approximately 30 vehicles, mostly trucks, are parked at random throughout the area. Seven buildings which predate the site are located near the southern road.

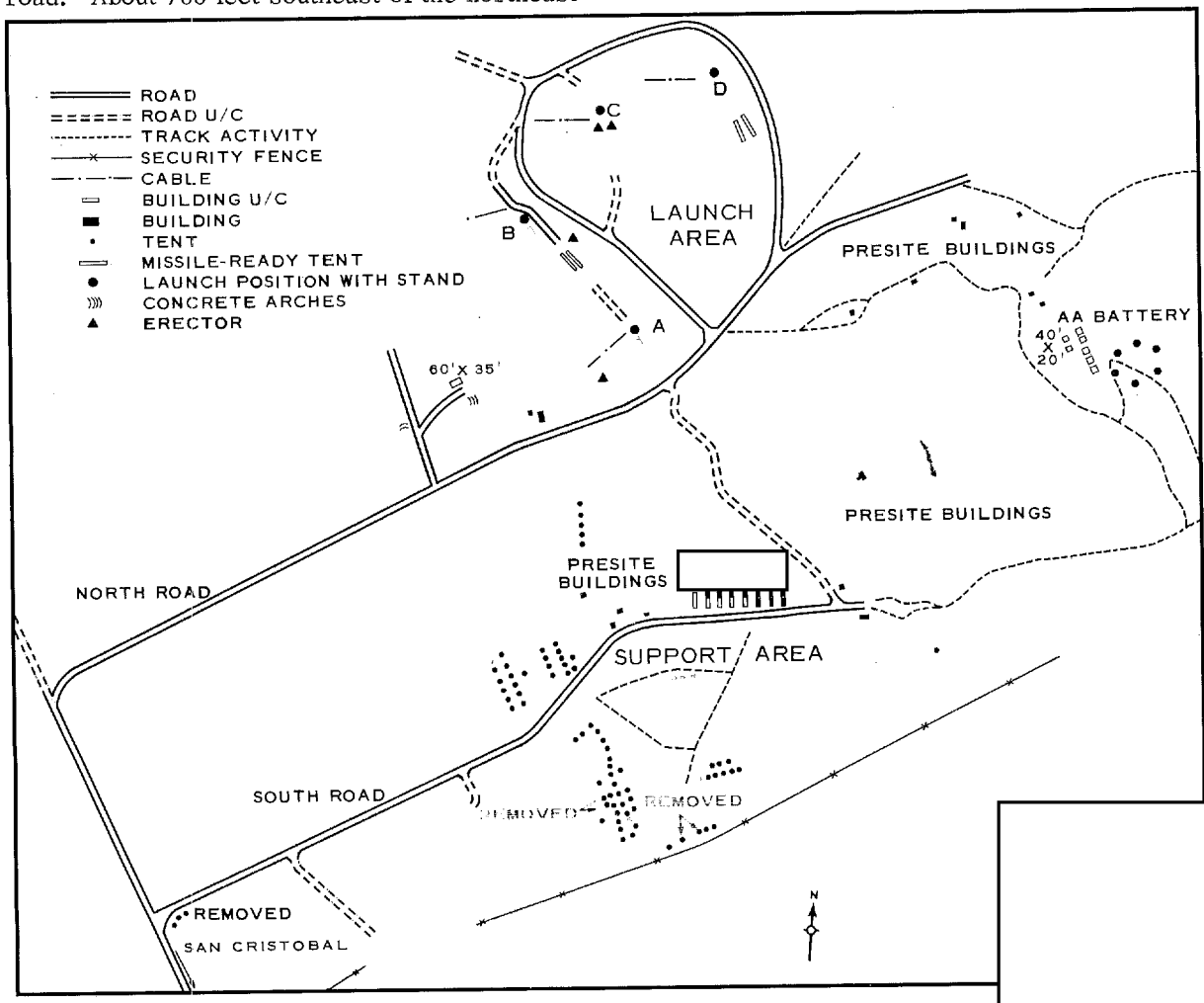


FIGURE 9. CONSTRUCTION PROGRESS AT SAN CRISTOBAL MRBM LAUNCH SITE 3.

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[redacted] A launch position (A) has been established on the south side of the loop road. The position consists of an octagonal concrete base and two pairs of concrete wheel leveling blocks. Two missile-ready tents have been erected--one within the loop road and the other 325 feet northwest of Launch Position A. An erector is parked alongside a hedgerow 160 feet south of Launch Position A and one definite and one possible missile transporter are parked alongside the hedgerow just north of the launch position. Two erectors are parked within the loop road near the north side, and a probable erector is located among the trees near the southwest edge of the loop road. The installation of security fencing has been started at the southwest end of the site. Sixty-one vehicles, including vans, trucks, cranes, and generators, are in the area.

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[redacted] Two additional launch positions (B and C) have been constructed and grading for a fourth one (D) is in progress. Launch Position B is located 600 feet northwest of Launch Position A; Launch Position C is located 880 feet north of Launch Position A and 550 feet northeast of Launch Position B. Launch Position D, still being graded, is located 520 feet east of Launch Position C and 1,060 feet northeast of Launch Position A.

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Launch Position A, first observed [redacted] [redacted] now has a launch stand in place. Cabling has not been installed. An erector is parked nearby. Launch Position B has a base, a launch stand, and wheel blocks in place but no cabling. An erector is parked nearby. Launch Position C has a base, a launch stand, and wheel blocks in place and cabling has been installed between the launch stand and a piece of unidentified equipment, possibly a junction box, 90 feet to the west.

A third missile-ready tent is being erected adjacent to the one between Launch Positions A and B. Seven of the eight buildings under

construction are now partially roofed. Twenty-two additional personnel/utility tents have been erected. There are 73 miscellaneous vehicles visible in the area.

[redacted] At Launch Position A, a road to the ready tent is being constructed. The launch stand is in place and an erector is parked just to the southeast. At Launch Position B, the launch stand is in place and an erector is parked just to the southeast. Grading is in progress on the northwest side of the launch position. The third missile-ready tent is completed. The launch stand is in place at Launch Position C and an erector is parked just to the south. At Launch Position D, both the launch stand and the erector are in place. A fourth missile-ready tent has been erected 220 feet southeast of the launch stand, alongside of one observed [redacted]

The previously identified missile transporter is not visible and is presumed to be in one of the ready tents. The possible missile transporter remains in the same position and still cannot be positively identified. Elsewhere in the area, concrete arches are being put in place at the 60- by 35-foot building under construction. The installation of security fencing continues along the south edge of the site and has begun along the north side. Three of the [redacted] buildings under construction have roofs, four are partially roofed, and one has only a foundation. Four more tents have been erected. There are approximately 90 miscellaneous vehicles in the area.

[redacted] The erector and launch stand are in place at Launch Position A. An unidentified piece of equipment has been placed 75 feet southwest of the launch stand. Cabling runs southwest from this piece of equipment into a patch of woods.

The launch stand is in place at Launch Position B, but the erector is not visible. An uniden-

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tified piece of equipment has been placed 75 feet northwest of the launch stand. Cabling runs west from this piece of equipment into a wooded area.

The launch stand is in place at Launch Position C; the erector is parked just to the south. Cabling has been extended west from the previously identified piece of equipment to a clump of trees.

The launch stand and erector are in place at Launch Position D. Cabling runs from a clump of trees toward the launch position but is not complete. The clump of trees is located 270 feet west of the launch position. Eight additional tents have been erected.

25X1D [redacted] The launch stand and erector are in place at Launch Position A and both are canvas covered. Cabling has been installed from the launch stand to an unidentified piece of equipment--enclosed on three sides by walls--and thence into a wooded area. Control vans are probably located in the wooded area. Launch Position A is probably operational.

The launch stand and erector are in place at Launch Position B and both are canvas covered. Cabling is not visible. Launch Position B is possibly operational.

The launch stand and erector are in place at Launch Position C and both are canvas covered. Cabling has been installed from the launch stand to an unidentified piece of equipment to the west and thence to a clump of trees. Control vans are probably located among the trees. A second cable runs at right angles to a probable generator. Launch Position C is probably operational.

The launch stand and erector are in place at Launch Position D and both are canvas covered. This position is situated in a wooded area and cabling and associated control vans are not visible on this coverage. Launch Position D is possibly operational.

There is one missile transporter parked along a hedgerow between Launch Positions

A and B. Four tents have been taken down and six have been erected; the present total is 75.

[redacted] There is no significant change in the launch positions except that theodolite stations have been identified at Launch Positions A, B, and C. One, masked by trees, may be located at Launch Position D. No missile-fuel or oxidizer trailers have been observed at the site and only one missile transporter has been confirmed. Otherwise, the site is probably operational.

Four of the eight buildings under construction have roofs, three are partially roofed, and one has prefab sections lying on the ground. A sawmill has been set up just north of these buildings under construction.

[redacted] There is no significant change in the launch positions. One missile transporter is evident. Vertical and horizontal camouflage has been erected at numerous points, concealing items of equipment. Roadways and walkways are being graveled. The arched-roof building appears to have all of its arches erected. Six of the eight buildings under construction are now completed; one is partially roofed, and one has only walls in place. Personnel trenches are being dug.

[redacted] There is no change in the launch positions. All are probably operational, although no fuel or oxidizer vehicles have been observed and only two missile transporters have been noted, one of these not a positive identification. Personnel trench construction continues and a six-gun AA battery has been emplaced on the east perimeter of the site.

[redacted] There is no change in the launch positions. All of the eight buildings previously identified as under construction have been completed (Figure 10).

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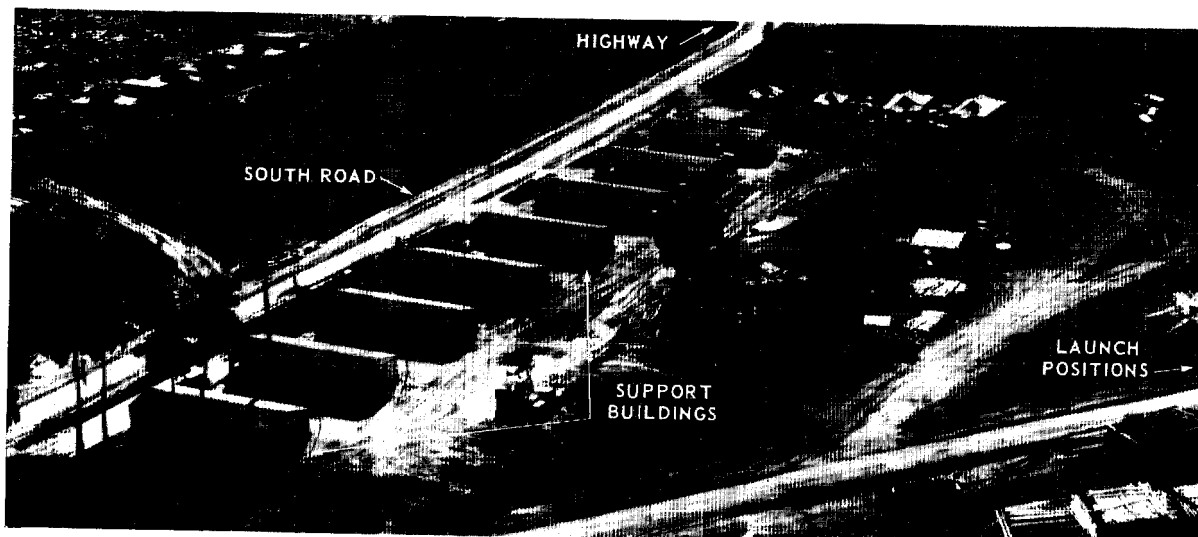


FIGURE 10. PERMANENT SUPPORT BUILDINGS

Construction activity is evident at the seven foundations/excavations on the east side of the site [redacted] (Figure II).

[redacted] The site is being abandoned. Equipment and camouflage have been removed and the launch positions are being destroyed.

CONCLUSIONS

The Soviet MRBM missile system which was deployed in the San Cristobal area in Cuba is a highly mobile system. It is probably organized into units--possibly battalions--which are individually capable of transporting, erecting, and servicing missile launch facilities and firing missiles. These units appear to have standard allowances of missile equipment, enabling them to establish four launch positions with a refire capability of one missile per launch position.

The length of time required to achieve

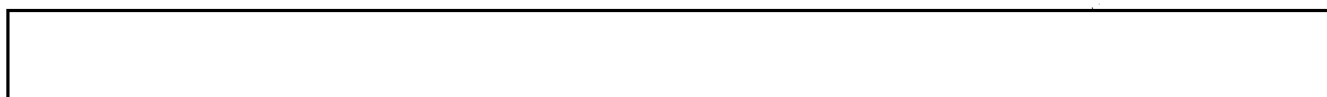
operational capability from the start of construction cannot be ascertained because the level of Soviet effort at the San Cristobal sites is indeterminate. For example, if the progress observed represented an 8-hour workday, a period of 10 to 14 days would probably be required. This period, therefore, could be shortened considerably if an all-out effort were made. Conversely, the period would be longer if the observed progress at San Cristobal was in fact an all-out effort.

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Table 1. Items Observed at San Cristobal MRRM Launch Site 3

Item	36	37	59	85	73	75					
Personnel tents											
Miscellaneous vehicles/equipment	approx 30	61	73	approx 90	approx 36	approx 53	incomplete photographic coverage				
Road construction/improvement	yes	same	same	continuing at Launch Position A		continuing at Launch Positions A and B					
Missile transporters	none	1 firm 1 poss	1 firm 1 poss	1 poss	none	1 firm	1 firm	incomplete coverage	1 firm	1 firm 1 poss	incomplete coverage
Missile-fuel tank trailers	none										
Missile oxidizer trailers	none										
Missile erectors	none	3 firm 1 prob	same	4 firm							
Missile-ready tents	none	2	2	4							
Launch positions graded	---	2 graded	4 graded								
Launch octagons	none	1	3	4							
Positions with wheel blocks	none	2	3	4							
Launch stands	none	1	3	4							
Cabling	none	none	1 position partial	1 position partial	4 positions	4 positions	probably complete				
Cable connectors	none	none	1	1	3	3	probably 4	probably 4	probably 4	4	
Control vehicles	none	none	none	1	3 prob	4 prob					
Theodolite station	none						probably 4				
Communications	not identified	microwave tower					nothing further identified				
Camouflage	none									vert and horiz	



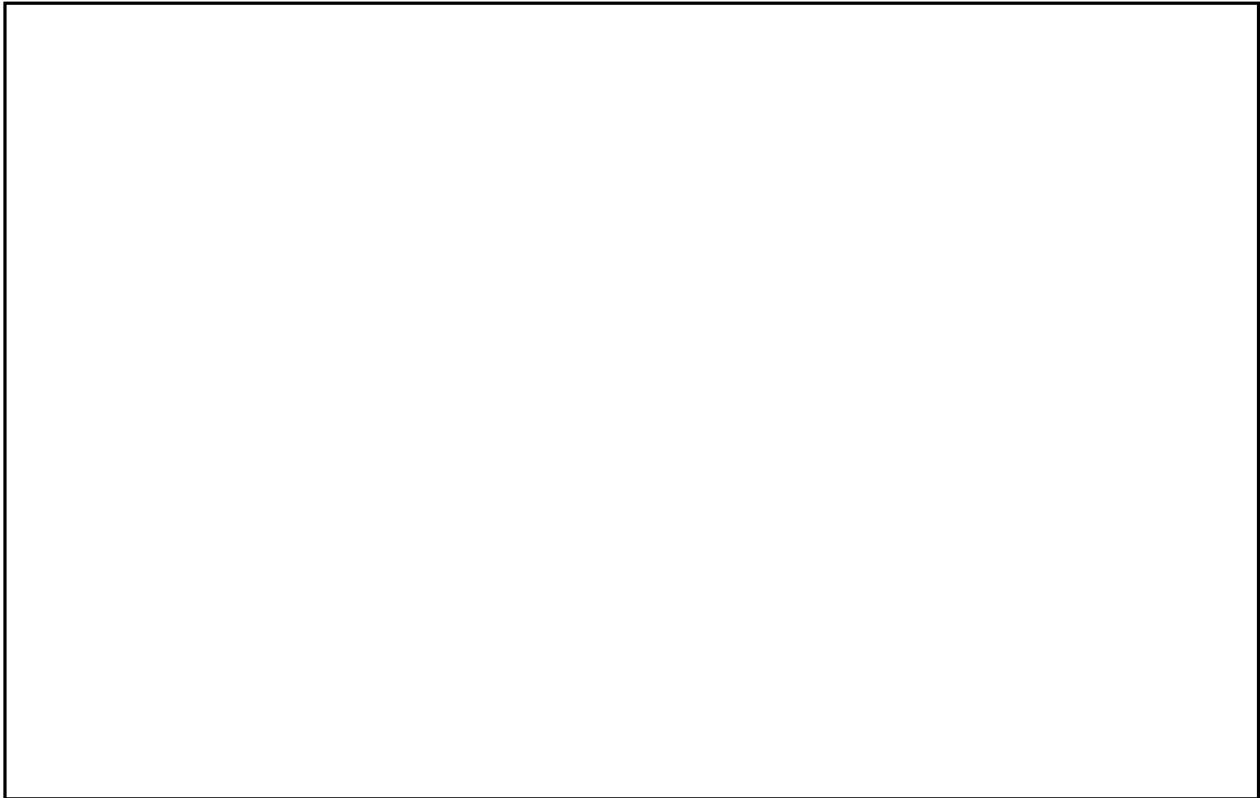
Permanent buildings	8 u/c, 7 foundations		3 complete, 5 u/c, 7 foundations		4 complete, incomplete 4 u/c	6 complete 2 u/c	8 complete	incomplete coverage
Security fence	not identified	begun on south side	same	begun on north side			not complete	
Defensive weapons	none					1 6-gun AA position		

* There was no photographic coverage
 ** High-level photography.
 *** Low-level photography.

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REFERENCES



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DOCUMENTS

1. Army. ID, SS-4 Ballistic Missile System, Nov 62 (SECRET)

MAPS OR CHARTS

AMS. Series E 723, Sheet 3584 II, 1st ed, Dec 60, scale 1:25,000 (OFFICIAL USE ONLY)

REQUIREMENTS

ONI 132-62

NPIC PROJECT

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